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3-Loop Corrections to the Heavy Flavor Wilson Coefficients in Deep-Inelastic Scattering

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A survey is presented on the calculation of the 3-loop QCD corrections to the heavy flavor Wilson coefficients in deep-inelastic scattering in the region of large momentum transfer $Q^2 \gg m^2$ and on the 3-loop matching coefficients in the variable flavor number scheme. Results are presented for the flavor non-singlet and pure singlet cases and for contributions due to Feynman diagrams containing internal fermion lines with two different masses, giving analytic results. We also present the mathematical and computer-algebraic methods to derive these results and discuss the numerical results, which are important in analyses measuring the heavy quark masses and the strong coupling constant.

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